XSEDE Canonical Use Case 2:

Transfer a File or Files

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Version 1.0

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A. Document History

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B. Document Scope

This document is both a user-facing document (publically accessible) and an internal working document intended to define user needs and use cases that fall within the overall activities of XSEDE. The definition of use cases is based on a template from Malan and Bredemeyer[1]. In general it is in keeping with the approaches and philosophy outlined in "Software architecture in practice."[2]

This document is one component of a process that generates at least the following documents, some of which are user-facing, some are as of now intended to be internal working documents:

- ***This document*** - A description of use cases [User facing]
- A set of level 3 decomposition documents, which include:
    - Quality Attributes descriptions
    - Connections diagram in UML

The use cases are presented here using the following format, derived from the Malan and Bredemeyer white paper[1] as follows:

Use Case	Use case identifier and reference number and modification history
Description	Goal to be achieved by use case and sources for requirement
References	References and citations relevant to use case
Actors	List of actors involved in use case
Prerequisites (Dependencies) & Assumptions	Conditions that must be true for use case to be possible Conditions that must be true for use case to terminate successfully
Steps	Interactions between actors and system that are necessary to achieve goal
Variations (optional)	Any variations in the steps of a use case
Quality Attributes	
Non-functional (optional)	List of non-functional requirements that the use case must meet
Issues	List of issues that remain to be resolved

[1] Malan, R., and D. Bredemeyer. 2001. Functional requirements and use cases. *www.bredemeyer.com/pdf_files/functreq.pdf*

[2] Bass, L., P Paul Clements, and Rick Kazman

C. Glossary

File system: A file system accessible via a file access service, that may be the source from which files are to be moved and/or the destination to which files are to be moved.
File transfer service: Receives and processes requests to initiate, monitor, and control transfers between file systems.
A valid file transfer request: consists of a source and destination that exist, where the target has sufficient disk space, where the user has permission to read the source and write the target, and where there exists a communication path from the source to the target.

D. Canonical Use Case 2

Use Case UC CAN 2	Transfer a file or files
Description	The user transfers one or more files and/or directories from one file system to another.
References	
Actors	User: The user initiates the file transfer activity and presents a valid file transfer request. The client may be a human at a command line interface or Web browser, or an application, such as a gateway, shell script, or Java, C, or Python program.
Prerequisites (Dependencies) & Assumptions	a) The client knows the address of the file transfer service. b) The client is properly authenticated. c) The client has generated a file transfer request in the appropriate format, specifying the file(s) and/or directory(s) that are to be transferred, and the source and destination file systems. d) The source file(s) and directory(s) named in the request exist and the client is authorized to read them. e) There is sufficient space for those file(s) and directory(s) on the destination file system, and the client is authorized to write at the specified destination location. f) The file transfer service, source file system, destination file system, and intervening network do not fail during execution of the file transfer.
Steps	The client sends a file transfer request to the file transfer service and receives some form of request identifier in return. The file transfer service begins execution of the transfer. The client may poll the file transfer service periodically, during and after the transfer, to determine the status of the transfer: for example, the amount of data and number of files that have been transferred successfully, and whether the transfer has completed or failed. The transfer completes.
Variations (optional)	a) The client can register with the file transfer service to receive notifications of file transfer state change. b) At most once semantics, meaning that if the client submits the same file transfer request more than once (e.g., because an earlier submission was not acknowledged), the transfer will be executed at most once. c) The client can request that a source file or directory and a destination file

	or directory be synchronized, meaning that only files that differ between the source and destination are transferred.
Quality Attributes	a) Any request to the file transfer service is acknowledged within one second.[source: campus bridging] b) The file transfer service can support XSEDE-wide a job submission rate of up to 1 requests/second in aggregate from all users without error. [source: A&D] c) The file transfer service can support XSEDE-wide, without error, at least 1,000 active transfer requests (i.e., under management, could be pending, active, etc) requests. [Source: A&D] d) Once a file transfer completes, the client can check its status for at least one month. [Note: Source: A&D.] e) Client request patterns that exceed the stated request submission rate or total active request limits are handled gracefully: e.g., by declining to accept further requests.[Source: campus bridging] f) The file transfer service can be restarted (e.g., following failure or system administrator action) without losing track of file transfer requests that are queued or active at three Sigma.[source: campus bridging] g) Valid file transfer requests complete at two sigma. [source:campus bridging] h) The file transfer service will be available at three Sigma. [source: campus bridging] i) The file transfer service can restart a transfer that is interrupted by transient failures. [source: campus bridging] j) The combination of transfer efficiency and impact of failures and restarts provides efficiency that is at least as good as 50% of peak theoretically possible throughput of optimal network path and storage systems. [source: campus bridging] [The A&D team feels that this is a difficult to measure attribute, in particular, peak bandwidth of end-to-end system.] k) If a user accesses a file system for which access is not authorized, the error message returned should be consistent, meaningful, and helpful. [source: campus bridging]
Non-functional (optional)	
Issues	